# Red Trail Energy - 2024 Output Audit Report

## For Puro.Earth

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|---|---|
| $CO_2$ Removal Supplier | Red Trail Energy LLC |
| Removal Method | Geologically Stored Carbon |
| Production Facilities | Red Trail Energy Ethanol Production Facility |
| Production Facility Addresses | 3682 Hwy 8S<br>Richardton, ND 58652 |
| Net Volume of $CO_2$ Removal | 221,264 CORCs |
| Removal Period | August 1, 2023 – January 31, 2025 |
| Auditor | 350Solutions<br>Kelly Inder-Nesbitt |
| Version | v1.2 |

Issued: February 27, 2025

# Contents

| OUTPUT AUDIT REPORT | | |
|---|---|---|
| Company: Red Trail Energy LLC | Company Contacts:<br>Jodi Johnson, CEO | Audit Team:<br>*Kelly Inder-Nesbitt<br>Bill Chatterton |
| Removal Method: Geologically Stored Carbon | | |
| Report Date: February 27, 2025 | | |
| Document No: 350VR-RT-PU2406 | | |
| Rev: 1.2 | | |

** primary contact/lead author*

# 1. Introduction

350Solutions, Inc. was contracted to perform an audit of carbon dioxide removal credit (CORC) claims for Red Trail Energy LLC geologically stored carbon process. 350Solutions declares that we are an impartial auditor, free from any conflicts of interest, capable, and qualified to complete this audit according to Puro Standard and related Validation and Verification Body Requirements.

In December 2023, 350Solutions conducted a Production Facility audit of the process, lifecycle $CO_2$ emissions assessment (LCA), and other administrative details to verify compliance with the requirements of the Puro.Earth Puro Standard General Rules (Version 3.1) and Geologically Stored Carbon Methodology (Edition 2021) [1], [2]. The Production Facility audit remains valid until December 2028. This follow-up output audit was conducted to verify Red Trail Energy's reported CORCs for the period of August 1, 2023 through January 31, 2025. The audit and verification began with a teleconference review on January 14, 2025, followed by a detailed document review and audit.

**Table 1. 2024 Red Trail Energy Output Audit Summary**

| Verification Summary | |
|---|---|
| **$CO_2$ Removal Supplier** | Red Trail Energy LLC |
| **Removal Method** | Geologically Stored Carbon |
| **Verification Type** | Annual removal supplier output audit; Puro Standard General Rules (v3.1) and Geologically Stored Carbon Methodology (Edition 2021) |
| **Production Facility Name and Registry** | Red Trail Energy Ethanol Production Plant, Facility ID: 353054 |
| **Production Facility Locations** | 3682 Hwy 8S, Richardton, ND 58652<br>Lat 46.883, Long -102.313 |
| **Verified CORCs** | 221264 tonne CO2 -eq |
| **Audit Kickoff Date** | January 14, 2025 |
| **Audit Report Date** | February 27, 2025 |

# 2. Technology Description

Red Trail Energy LLC (RTE) owns and operates an ethanol production plant near Richardton, North Dakota. The plant complex is situated inside a footprint of approximately 25 acres of land which is part of an approximately 135-acre parcel. The plant was placed into service in January 2007 and is

capable of producing in excess of its name-plate production capacity of 50 million gallons of ethanol per year. RTE uses corn as feedstock to produce ethanol at the plant.

RTE is currently operating a carbon dioxide ($CO_2$) capture and storage (CCS) facility adjacent to the RTE ethanol plant, to ultimately inject about nominal 180,000 tonnes $CO_2$ annually more than a mile below RTE property for permanent storage. In partnership with the North Dakota Industrial Commission Renewable Energy Program and the U.S. Department of Energy (DOE), the RTE CCS Project was determined a technically viable option for the significant reduction of $CO_2$ emissions from ethanol production. The project was also supported by the Energy & Environmental Research Center EERC-led Plains $CO_2$ Reduction (PCOR) Partnership. The process is summarized in Figure 1.

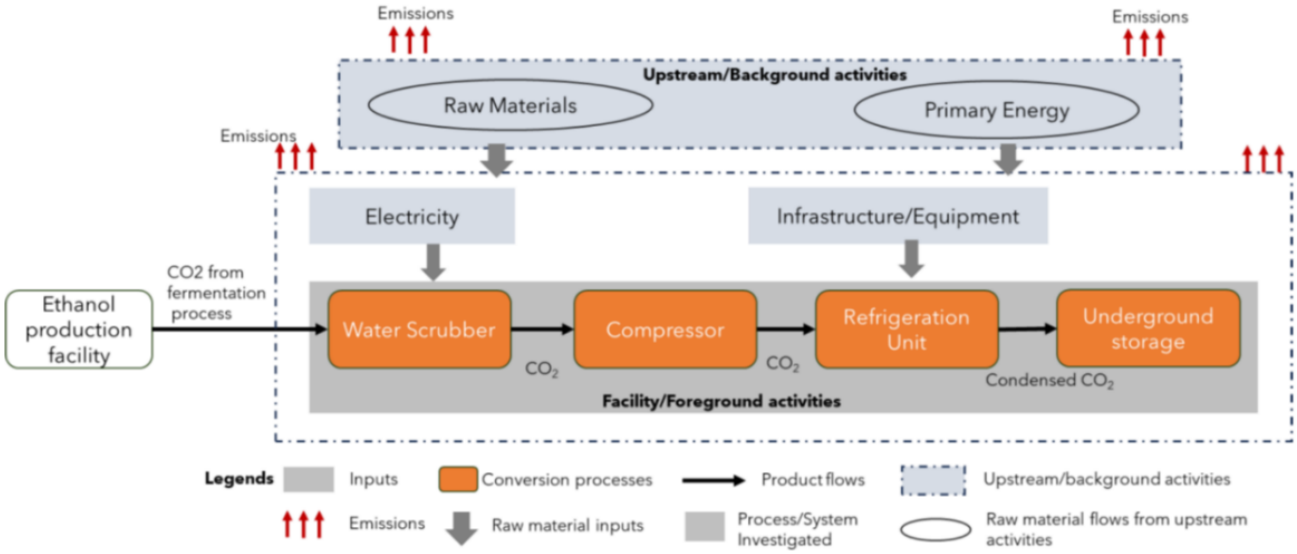


**Figure 1. Red Trail Energy Carbon Capture and Geological Storage Process**

## 2.1. Process Inputs & Outputs

The system boundary for the RTE CCS process starts at the gate of the $CO_2$ processing facility, first treating the exhaust gas received from the ethanol plant. The ethanol production facility is outside of the system boundary considered for this project. Furthermore, the LCA is carried out considering both (a) upstream or background systems, which are responsible for producing and supplying raw materials (e.g., equipment, infrastructures, fuels) to the CCS-facility, and (b) facility or foreground systems, where actual processing of fermented $CO_2$ takes place and of which this evaluation is carried upon.

For geologically stored carbon CORCs, the functional unit is 1 kg of $CO_2$ captured and stored in a compliant storage site. The injected $CO_2$ is greater than 99.9% purity and contains some trace quantities of nitrogen and oxygen. The process uses electricity only for operation of equipment.

RTE's CCS process produces very little to no waste products and has very limited emissions of any kind from the facility. Waste produced from the CCS process (primarily water removed from the captured $CO_2$ stream) are recycled back to the fermentation process. There are no air emission points outside of process bypass equipment which is not used during normal operations. No bypass or venting events were recorded during the reporting period. All $CO_2$ capture is processed

(water removal, trace organic and inorganic contaminant removal, compression, and liquefaction) and injected at the wellhead. Table 2 summarizes the observed inputs and outputs from the process and typical rates from supplied operational data.

**Table 2. Verified Production Facility Inputs & Outputs**

| Input or Output | Item | Verified Amount Over Monitoring Period[1] | Notes (Specifications, source, etc.) |
|---|---|---|---|
| Inputs | Water | NA | Water removed from captured $CO_2$ recycled to fermentation process. |
| | Electricity use (Blowers, pumps, compressors, chillers, controls) | 46,733 MWh | Power consumption during reporting period for all equipment within the $CO_2$ capture and injection boundary, measured using utility revenue grade metering. |
| | Electrical and mechanical equipment, infrastructure, pipeline, monitoring and injection wells, controls[2] | NA | Basis for LCA emission factors for primary CCS process equipment and infrastructure (Ecoinvent V3.3.1 and GREET 2022 databases used for emission factors and calculation). |
| Outputs | $CO_2$ injected ($C_{injected}$) | 253,444 tonne $CO_2$ | Biogenic $CO_2$ captured from fermentation process and injected during reporting period August 2023 – January 2025, as measured at wellhead (dry basis). |
| | CCS process emissions | 32,180 tonne $CO_2e$ | From LCA ($E_{capture}$, $E_{transport}$, and $E_{injection}$) |

*[1] CORC calculations are based on the net $CO_2$ emission rate determined and verified in the LCA for RTE by EcoEngineers. The values of inputs during the reporting period are verified and reported here for completeness.*
*[2] The materials required for the wellbore construction are estimated based on the wellbore design. For the wellbore construction, carbon resistant cement is assumed as raw materials being used. As the EFs of such materials are not available, the EF of the Portland cement is assumed as a substitute data. Due to the lack of EF data for specific steel grades, generic steel production data for the U.S. is used for pipeline construction and skid production. For the wellbore tubing chromium steel 18-8 data is used in place of 13 Cr.80.*

# 3. Audit Summary

## 3.1. Audit Approach

A planned series of audit activities were conducted by 350Solutions to independently validate and verify production and output data, and CORC claims for the reporting period. The audit was conducted following the specifications of Puro General Rules (Version 3.1) and Geologically Stored Carbon Methodology (Edition 2021). Specific audit activities conducted are summarized in Table 3. A completed Puro Geologically Stored Carbon Methodology Audit Checklist used during the audit is attached to this report as Appendix 1. Auditor qualifications are attached as Appendix 2.

**Table 3. Audit Activities**

| Date(s) | Verification Activity | Verification Tasks | Documents Reviewed |
|---|---|---|---|
| **January 14, 2025** | Teleconference and Introductory Document Review | - Opening meeting and review of operational and procedural changes<br>- Review of LCA and supporting documentation<br>- Review of Puro CORC calculations | - Audit Document Index - Red Trail Energy.xlsx<br>- Disclosure since last audit Red Trail 12 RTE December 2024 Form26.xlsx |

| | | | |
|---|---|---|---|
| | | - Review of product properties<br>- Review of product end use | - RED TRAIL ENERGY ALLOCATION REPORT (3) .xlsx<br>- CO2 Injection Record for Accounting.xlsx<br>- Red Trail CO2 Tonnes Injected Update through 1.31.2025.xlsx<br>- Red Trail Energy Complete Monitoring Plan.pdf<br>- 1.2 GENERAL ARRANGEMENT DRAWINGS Salof - Buildings square footage.pdf<br>- Rte-capture-design-package - pipeline length.pdf<br>- S20007 Red Trail Tagged Equipment 2021.11.10 - Eco.xlsx<br>- Table 15 - S20007-RTE-Electrical Equipment Information - Eco.xlsx<br>- Calibration Records Red Trail Energy.pdf<br>- Carbon Dioxide Analysis RTE November 2024.pdf<br>- Puro_LCA Report RTE 2024_FINAL.pdf<br>- Puro_LCA_Red Trail_v2024.xlsm<br>- Roughrider Electric 09.2024.pdf<br>- RTE Information 8.2023-10.2024 update (1).xlsm<br>- 01 - January 2024 Form26 – Amended.xlsx<br>- 11 RTE November 2024 Form26.xlsx<br>- RR Electricity Usage<br>- RTE - puro_LCA Model - GCS_G<br>- RTE Equipment and Infrastructure efs - Part 1<br>- RTE Equipment and Infrastructure efs - Part 2<br>- Calibration Report June 2024 |
| **February 1 – 25, 2025** | Data Review | - Review of LCA and supporting documentation<br>- Review of Puro CORC calculations<br>- Review of facility registries and permits<br>- Review of raw material sources and sustainability<br>- Review of system inputs and outputs<br>- Review evidence of product output<br>- Review of product properties<br>- Review of product end use<br>- Review of equipment and calibrations | |
| **February 21 – 26, 2025** | Report Writing | - Compose Verification Report<br>- Internal quality control | *No additional documents reviewed following data review* |

## 3.2. Verified Output & CORCs

Table 4 includes the specific CORCs claimed by RTE for its Richardton facility during the reporting period, as well as the level verified by 350Solutions during the on-site audit and data review.

**Table 4. Verified CORCs for Red Trail Energy**

| Performance Metric Name / Description | Verified Value | Data Sources | Reporting Period |
|---|---|---|---|
| **Net $CO_2$ Removal Factor**[1] | -0.87 | Puro_LCA Report RTE 2024_FINAL.pdf<br>Puro_LCA_Red Trail_v2024.xlsm<br>RTE - puro_LCA Model - GCS_G<br>RTE Information 8.2023-10.2024 update (1).xlsm<br>Red Trail CO2 Tonnes Injected Update through 1.31.2025.xlsx<br>RR Electricity Usage | August 1, 2023 – January 31, 2025 |
| **$CO_2$ Captured ($C_{injected}$)** | 253,444 tonne | | |
| **CCS Process emissions ($E_{capture}$, $E_{transport}$, and $E_{injection}$)**[2] | 32,180 tonne $CO_{2e}$ | | |
| **Emissions from construction of CCS equipment ($E_{equipment}$)** | 0 (emissions already accounted for in previous auditing period) | | |
| **CORCs** | 221,264 tonne $CO_{2e}$ | | |
| **CORCs Retired** | 128,653 tonne $CO_{2e}$ | | |

[1]*Defined in LCA as carbon intensity (CI): as how many grams of carbon dioxide ($CO_2$) are released in the entire process of capturing and storing 1 kg of $CO_2$. A negative number means that carbon is removed/injected more than released/emitted.*

[2]*$C_{loss}$ is defined as zero for the CCS process, with $CO_2$ flow monitoring conducted at the capture point ($CO_2$ capture at fermentation) and the wellhead injection point.*

RTE reports the amount of $CO_2$ injected each month to the North Dakota Industrial Commission (NDIC) for Class VI well compliance. During this reporting period, a total of **253,444 tonnes** of $CO_2$ was injected. To determine the net $CO_2$ removal, project emissions—**32,180 tonnes** of $CO_2$—are subtracted, resulting in **221,264 tonnes net $CO_2$ removal**, which are eligible for issuance as Carbon Dioxide Removal Credits (CORCs).

The CORCs are allocated between two markets:

1. **Low Carbon Fuel Standard (LCFS) markets** – where $CO_2$ removal is linked to ethanol sales in jurisdictions with LCFS programs.
2. **Voluntary Carbon Markets (VCM)** – where the remaining bio-CCS carbon sequestration credits are available for sale.

Ethanol sales are tracked monthly and categorized based on whether they are sold into LCFS or non-LCFS markets. The percentage of ethanol gallons sold into each category is used to proportionally allocate CORCs.

During this reporting period:

- **128,653 tonnes** of $CO_2$ were allocated to LCFS markets and retired.
- The remaining **92,612 tonnes** of net $CO_2$ injected are available for the VCM.

These allocations, along with supporting sales records, were documented in the file *"Red Trail $CO_2$ Tonnes Injected Update 1.31.2025.xls"* and were reviewed and verified during the site visit.

# 4. Audit Findings

## 4.1. Summary of Audit Findings

350Solutions has reviewed and audited the documentation of the technology, the instrumentation, the procedures, performance and collected data and has found that the data presented in the Puro Audit Package and during the site visit and follow up:

☒ ***Meets the requirements of the Puro General Rules V3.1 and Geologically Stored Carbon Methodology***

☐ ***Meets the requirements of the Puro General Rules V3.1 and Geologically Stored Carbon Methodology with minor modifications***

☐ ***Does Not Meet the requirements of the Puro General Rules V3.1 and Geologically Stored Carbon Methodology***

350Solutions utilized a reasonable level of assurance in performance of the outputs audit. A summary of specific findings associated with each requirement of the Puro Standard and Geologically Stored Carbon Methodology and any identified issues with the audit are summarized below.

**Table 5. Audit Findings**

| Puro Standard GSC Method. Section Ref. | Audit Verification Topic | Final Findings |
|---|---|---|
| ***1.1.*** | *Eligible Activity Type* | Acceptable – The site is suitable for geological sequestration of biogenic $CO_2$ being injected in an NDIC compliant Class VI well. |
| ***1.2.*** | *Eligibility Requirements* | Acceptable – RTE is an LLC registered with the Puro Registry for the listing of $CO_2$ removal Certificates (CORCs). They achieve this by sequestering biogenic $CO_2$ from the ethanol production process that would otherwise be vented to the atmosphere. Biogenic $CO_2$ fraction via carbon isotope (C14) results 99%.<br><br>RTE has demonstrated conformance to the EU directive RED II as a 1st generation ethanol plant. Environmental assessments and historical records confirm corn as feedstock, and that the associated agricultural land was never previously an area of high biodiversity value, nor did it transition from regions with high carbon stock. RTE has documented committal to disclose fossil energy consumption and maintain level or reduced fossil energy consumption over time. |
| ***1.3.***<br>*5.1.2*<br>*5.1.3* | *$CO_2$ Removal Supplier* | Acceptable – RTE has contracts with biomass suppliers to demonstrate feedstock sustainability. The facility can record the mass of $CO_2$ sequestered and demonstrate the mass injected. Facility maintains an NDIC permit showing that the Class VI UIC program meets or exceeds the stringency of the federal EPA Class VI program. The quantification of the $CO_2$ is finalized by third-party $CO_2$ purity analysis of representative injection gas samples. |
| ***2.*** | *Point of creation of the $CO_2$ Removal Certificate (CORC)* | Acceptable – Verified accurate monitoring of $CO_2$ injection rates at point of removal. RTE is the operator of the sequestration site and owner of the contracts for the for the carbon containing waste. |
| ***3.1*** | *Life-Cycle Analysis (LCA) Boundary* | Acceptable - The activity boundary includes all activities existing solely for the purpose of $CO_2$ removal. The LCA boundary begins with the capture of the carbon containing wastes, includes emissions associated with all equipment and inputs utilized for $CO_2$ processing and transport, proceeding to the injection site, includes all onsite operations energy usage and emissions, and monitoring of the wells. The upstream production of the carbon containing ethanol product is not included in the LCA since they are not produced for the purpose of sequestration. |

| | | |
|---|---|---|
| ***3.2***<br>*4.3.3* | *Activity emissions within the LCA boundary* | Acceptable –Onsite energy consumption associated with capture, compression, water removal, liquefaction, and transport to the wellhead is measured and recorded. All emission factors used for associated equipment and activities are lifecycle based, include cradle-to-grave considerations, and are estimated using GREET 2022 and Ecoinvent v3.3.1 databases. |
| ***3.3***<br>*4.2.1 – 4.2.5* | *Feedstock emissions within the LCA boundary* | Acceptable – Feedstock emissions are associated with ethanol production and outside of the CCS boundary for $CO_2$ capture and storage. |
| ***3.4*** | *Equipment/Facility emissions within the LCA boundary* | Acceptable – All emission factors used for associated equipment and activities are included in the LCA GREET 2022 and Ecoinvent v3.3.1 databases. Note that all equipment emissions are accounted for during this reporting period. |
| ***3.5*** | *Emissions outside the LCA boundary* | Acceptable – Emissions associated with operations not purpose built for $CO_2$ sequestration are outside the boundary. |
| ***4.1,*** *4.3.1, 4.3.2*<br>***4.4***<br>***5.2*** | *Net Negative LCA* | Acceptable - RTE has demonstrated an appropriate basis for CORCs according to the Puro Methodology. The LCA was completed and independently verified. The LCA utilizes appropriate system boundaries and results in a net negative LCA. Note that the LCA for this reporting period was developed using data collected between Aug 1, 2023 and Oct 31, 2024 (excludes final three months reported for CORCs). Due to the very stable nature of process operations, this is not expected to impact reported results. |
| ***4.5*** | *Uncertainty assessment* | Partially Acceptable - RTE uses conservative values in the LCA, however, the uncertainty range of the values was not fully included. Activity supporting measurements ($CO_2$ capture and injection rates, waste gas $CO_2$ purity analyses) are conducted using high quality procedures and best practices. |
| ***5.3*** | *Permanence* | Acceptable – The injection well and storage site are properly permitted and permit compliance demonstrated, including permanence and monitoring requirements (RTE utilizes state permitted Class VI well for injection of liquid $CO_2$). |
| ***5.4*** | *Evidence against double counting* | Acceptable – Attestations of RTE sole ownership of $CO_2$ claims provided. No claims of ownership by other parties can be made. Carbon market allocations for ethanol sale compliance obligation claims are quantified, tracked, and reported. |

Additional details regarding audit activities, documents reviewed, and observations during the audit process are summarized in Appendix 1.

## 4.2. Ongoing Issuance

Puro.earth are currently transitioning to use the 4.0 version of the Puro General Rules. Although this Output Audit was conducted using version 3.1 of the General Rules, certain rules described in the

updated version of the document (v4.0), such as the Ongoing Issuance Right, are applicable to all projects currently registered or in the process of getting registered on the registry. Specifically, Appendix A of the updated rules dictates that “the evaluation of the Ongoing Issuance Right is done in the performance verification by the 3rd party Auditor as part of the Output Audit” (A.4.1) and that "This evaluation can be done when a Production Facility has demonstrated regular industrial operation and successfully completed performance verification for the previous Monitoring Period with a minimum of 3 months of output” (A.4.2).

350Solutions confirms that the Red Trail Energy production facility audited here is eligible for Ongoing Issuance because they have successfully demonstrated regular industrial operation and verifiable reporting for over 3 months.

### 4.3. Audit Issues

No audit issues are noted for the reporting period.

### 4.4. Recommendations for Improvement

No recommendations for improvement are noted at this time.

## 5. Revision History

| Version | Date Issued | Noted Changes |
|---|---|---|
| **Draft v1.0** | February 26, 2025 | Initial Draft |
| **Draft v1.1** | February 26, 2025 | 350Solutions internal QA review, minor edits |
| **Final v1.2** | February 27, 2025 | Puro.Earth review comments included |

## 6. Auditor Signatures

Kelly Inder-Nesbitt

Digitally signed by Kelly Inder-Nesbitt
Date: 2025.02.28 09:29:43 -05'00'

Kelly Inder-Nesbitt (Lead Auditor)
Carbon Removal Verification Manager
350Solutions, Inc.

Bill Chatterton, 02-28-2025

Bill Chatterton (Quality Assurance)
Carbon Removal Verification Engineer
350Solutions, Inc.

# 7. References

[1] Puro.Earth, *Puro Standard General Rules, Version 3.1, Edition 2023*. https://puro.earth/puro-standard-carbon-removal-credits/

[2] Puro.Earth, *Geologically Stored Carbon Methodology, Edition 2021*. https://puro.earth/articles/beccs-and-geologically-stored-carbon-methodology-webinar-1-616?type=webinars-and-videos

***See Appendix 1 for list of specific files reviewed during the verification audit.***

# Appendix 1: Puro.Earth Geologically Stored Carbon Methodology Audit Checklist

*Please refer to the Geologically Stored Carbon Methodology Edition 2021 for additional details and supporting references.*

| Topic Area | Guideline Reference | Requirement | Requirement Met Y/N or Not Applicable (NA) | Compliance Evidence Provided Insert evidence used to verify requirement | Site Visit Findings If applicable | Verification Remarks Insert auditors comments | Value Insert numerical value or description (if applicable) | Units Insert unit (if applicable) |
|---|---|---|---|---|---|---|---|---|
| **Eligibility Checklist** | | | | | | | | |
| General Eligibility Requirements | Puro Geologically Stored Carbon Methodology - 2021 - (GSCM) 1.1 Eligible capture & storage types | **The production facility is technologically capable of increasing geologically stored carbon stock by storing CO2 or other GHGs captured directly from atmosphere or from biogenic sources.** | Y | 2023 site observation of entire process in operation; Project_Plan_RTE_FINAL.pdf, System boundary-RTE-CCS_11102023.ppt, rte-capture-design-package - pipeline length.pdf, Puro_LCA Report RTE 2024_FINAL_A.pdf | Full tour of production facility including feedstock delivery, ethanol production, CO2 capture from fermentation process, CO2 processing and liquifaction, CO2 transport to well head, and CO2 injection. | RTE owns and operates an ethanol production plant near Richardton, North Dakota, placed into service in January 2007 and is capable of producing in excess of 50 million gallons of ethanol per year. The project captures CO2 generated by the fermentation process . Fermentation exhaust is cleaned using a water scrubber to produce a purity stream of CO2. From the scrubber CO2 exhaust is pressurized, dehydrated cooled, distilled and pumped through a flowline to an injection well onsite where it is sequestered permanently in the Broom Creek formation. The injected gas has high CO2 purity (greater than 99.9%) . | | |
| | | **The production facility utilizes eligible geological storage type: A. Direct injection of CO2 into geological formations EPA Class VI or EU CCS); B. Injection of carbon containing substance in reservoir (EPA Class I, II); or C. Storage in oil and gas reservoirs as part of EOR+ (EPA Class II well storage with more CO2 injected than CO2e in oil extracted).** | Y | Evidence of the permanent storage.doc, TITLE V PERMIT TO OPERATE (Current).pdf, RTE Broom Creek Storage Facility Certificates signed 4.4.23.pdf, https://www.dmr.nd.gov/dmr/oilgas/ClassVI, | Well heads were physically observed at the time of the site visit and permits/monitoring reports for the wells were supplied by RTE | RTE utilizes state permitted Class VI well for injection of liquid CO2, see "RTE 10 (WF 37229) – Class VI injection permit" | | |
| | | **The production facility utilizes eligible carbon capture types: A. Direct air capture; B. Biogenic CO2 from combustion of biomass, bioliquids, or biogas (i.e. BECCS, bio-CCS); C. Biogenic CO2 fraction from incineration of biomass mixed with other substances; D. Biogenic CO2 from biogas upgrading process; E. Biogenic CO2 capture from oxidization of biogenic materials in industrial processes; or F. Biogenic carbon-containing substance.** | Y | CO2 analysis constitutes from Scrubber 4-2-2019.pdf, Site observation of entire process in operation; Project_Plan_RTE_FINAL.pdf, System boundary-RTE-CCS_11102023.ppt, Puro_LCA Report RTE 2023_FINAL_A.pdf | Type F: Biogenic carbon-containing substance, ethanol production from corn feestock | Type F: Biogenic carbon-containing substance, ethanol production from corn feestock | | |
| | GSCM 1.2.2 | **Evidence of geological storage permanence - eligible geological storages are controlled by EU or US laws and authorities or following similar requirements as set out by those legislations (See Row 13)** | Y | Evidence of the permanent storage.doc, TITLE V PERMIT TO OPERATE (Current).pdf, RTE Broom Creek Storage Facility Certificates signed 4.4.23.pdf, https://www.dmr.nd.gov/dmr/oilgas/ClassVI, | numerous studies underway by EERC and RITE in regard to monitoring the co2 plume. No updates for plume study at this time. | | | |
| | GSCM 1.2.3 | **Evidence of biogenic CO2 source sustainability (see also GSCM Section 5.1.3)** | Y | Project_Plan_RTE_FINAL.pdf, Red Trail Energy Businesss Feasibility Study PPT 5-2020v3.pdf, CO2 analysis constitutes from Scrubber 4-2-2019.pdf, Puro_LCA Report RTE 2024_FINAL_A.pdf, | Evidence of feedstock sustainability, see Section 2.1.3 of Project Plan | RTE secures and grinds approximately 22 million bushels of corn per year as feedstock for its dry milling process The corn is supplied primarily by farmers and local grain elevators in North Dakota and South Dakota According to the USDA North Dakota and South Dakota produced approximately 455 and 567 million bushels of corn, respectively, in 2019 | | |
| | GSCM 1.2.4 | **Only biogenic CO2 source is counted if a mixed fossil-biogenic flue gas or similar mixed sources is used** | NA | Project_Plan_RTE_FINAL.pdf, System boundary-RTE-CCS_11102023.ppt, Puro_LCA RedTrail_v2024.xls | Confirmed biogenic sourced CO2 from ethanol production only | | | |
| | GSCM 1.2.5 | **The activities should do no net harm to environment, e.g. cause deforestation, loss of biodiversity or to society through loss of arable land and decreased food security, chemical emissions or health risks.** | Y | Project_Plan_RTE_FINAL.pdf (Section 2.1), Evidence of the permanent storage.doc, TITLE V PERMIT TO OPERATE - (Current).pdf, https://www.dmr.nd.gov/dmr/oilgas/ClassVI, | | All processes located on RTE property, public outreach activites completed, fully permitted by relevant jurisdictions, plant has been in production since 2007, and feedstocks are demonstrated sustainable. | | |
| | GSCM 1.3.1, 5.1.3 | **The CO2 Removal Supplier is capable of metering CO2e injected reliably and consistently via appropriate metering technology and C content of injected CO2 or biomass stream (see also Section 4)** | Y | Project_Plan_RTE_FINAL.pdf (Section 3), Puro_LCA Report RTE 2024_FINAL_A.pdf, RTE Information Update 11132023.xls, rte-capture-design-package - pipeline length.pdf | Coriolis meters audit and observation, purity analyses. Review of PFD and PID in design package doc | Mass flow of CO2 metering is verified acceptable. Measurements are taken at the well head daily. The readings are automatically recorded in a data management system that produces a production report with the readings. Purity testing of CO2 is conducted through off-site analysis of collected samples, on a quarterly basis. Laboratory is ISO 17025 accredited. | | |
| | GSCM 1.3.1, 5.2 | **The CO2 Removal Supplier is capable of calculating the net CO2 removal using an appropriate lifecycle emissions approach, providing all calculation details, assumptions, and results reliably and consistently** | Y | Project_Plan_RTE_FINAL.pdf (Section 3), Puro_LCA Report RTE 2024_FINAL_A.pdf, RTE Information Update 11132023.xls | review corc calcs in LCA | LCA completed by EcoEngineering. All supporting data provided by RTE and verified by EcoEngineering for use in LCA. LCA approaches and calculations all reviewed and verified. | | |
| | EU directive RED II | **a.The only eligible type of 1st generation ethanol plants are the plants have produced 1st generation ethanol for a minimum of 5 years with the same feedstock and same land use.<br>b. The 1st generation ethanol plant commits to disclose its fossil energy consumption for ethanol production and aim to maintain the same level or reduce the consumption over time.** | Y | Project_Plan_RTE_FINAL.pdf (Section 3), Puro_LCA Report RTE 2024_FINAL_A.pdf, RTE Information Update 11132023.xls | Acceptable | The land adjacent to RTE is agricultural land that has been farmed since at least 1972 based on direct aerial photography as noted in a Phase I Environmental Site Assessment report. Historical records confirm that the adjacent agricultural land was never previously an area of high biodiversity value, nor did it transition from regions with high carbon stock after January 2008. This meets the biomass sustainability requirement as per the EU directive RED II | | |

| Production (Capture & Storage) Facility Checklist (Desktop, Verbal, or Site Visit Confirmation) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Lifecycle Analysis / Activity Boundary for Net Negativity | Annex G - 3 (Lifecycle GHG Emissions Boundary & Method | **GHG emissions have to be assessed and reported following the LCA calculation principles of ISO, WRI or PAS2050** | Y | puro_LCA_Red Trail_v2024 | Viewed documentation and verified during remote audit | Verified conformant, used Oregon GREET carbon intensity values | | |
| | GSCM 3.1 | **The activity boundary includes all activities existing solely for the purpose of CO2 Removal. These include the carbon capture, transportation and storing into the geological storages, and biomass cradle to gate if biomass is purpose-grown for carbon removal.** | Y | Project_Plan_RTE_FINAL.pdf, Puro_LCA Report RTE 2024_FINAL_A.pdf, System boundary-RTE-CCS_11102023.ppt | Viewed documentation and verified during remote audit | LCA boundaries start with the capture of CO2 from the ethanol fermentation process and includes CO2e for purification (water organic, and inorganic controls), compression, cooling, geologic injection, and site monitoring. | | |
| | GSCM 3.2, 3.3, 3.4 | **Emissions within the activity boundary include:<br>- All activities related to capturing (e.g. capture, liquefaction),<br>- transporting (e.g. through pipelines or by shipping) and<br>- storing (e.g. intermediate storages, injection) of the CO2<br>- CO2 emissions resulting from these activities;<br>- Purpose-grown biomass (e.g. emissions from cultivation, harvesting and transportation of the biomass cradle-to-gate) if the biomass is solely grown for CO2 removal purposes;<br>- Purpose-built equipment and facilities (e.g. emissions from materials and construction), and;<br>- Other activities that do not exist solely for the purpose of CO2 removal even if they are physically connected to carbon capture.** | Y | Project_Plan_RTE_FINAL.pdf, Puro_LCA Report RTE 2024_FINAL_A.pdf, System boundary-RTE-CCS_11102023.ppt | Viewed documentation and verified during remote audit | LCA boundaries start with the capture of CO2 from the ethanol fermentation process and includes CO2e for purification (scrubber), compression, cooling, geologic injection, and site monitoring. There are no transportation related emissions within the project boundary | | |
| | PGR 2.1.4 | **The Supplier has assessed all potential sources of leakage (i.e. increases in fossil emissions) outside of the project boundary but due to the development and operation of the project. Where identified, leakage sources are quantified and included in the LCA.** | Y | Project_Plan_RTE_FINAL.pdf, Puro_LCA Report RTE 2024_FINAL_A.pdf, System boundary-RTE-CCS_11102023.ppt | LCA also accounts for alternative fates of the products such as spreading on crop land, disposal via landfill, etc. | No economic leakage associated with project. An ISO 31000 conformant screening level risk assessment (SLRA) was condcuted to evaluate potential of subsurface leakage. This leakage assessment determined none of the pathways required corrective action and the probability of storage reversals are unlikely. | | |
| | GSCM 3.5 | **The LCA boundary does NOT include any of the following:<br>- biomass cradle to gate if NOT purpose grown for carbon removal<br>- emissions from any process creating biogenic carbon to be captured (e.g. waste treatment, bioenergy plant, biogas processing) that do not exist solely for the purpose of CO2 removal** | Y | Project_Plan_RTE_FINAL.pdf, Puro_LCA Report RTE 2023_FINAL_A.pdf, System boundary-RTE-CCS_11102023.ppt | Verified | All CO2 captured and stored by the supplier is byproduct of on-site ethanol fermentation process. | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Evidence of Quantification - Captured & Injected CO2 | GSCM 4.2.2, 5.1.1 | **In the case of direct air capture, the Supplier demonstrates that the origin of their CO2 is atmospheric by providing operational data records that are able to rule out other origins of the CO2.**<br>**- Evidence should include directly measured process data indicating the amount of CO2 captured and the plant performance (i.e. CO2 capture efficiency or CO2 material balance)**<br>**- evidence must demonstrate that the CO2 amount delivered by the DAC plant is not greater than the actual plant performance would allow.** | NA | NA | NA | NA | | |
| | GSCM 1.2.3, 4.2.2, 3.3, 5.1.3 | **In the case of biogenic CO2 capture, the biomass is documented as sustainable (e.g. meets the requirements of EU directive REDII for sustainable biomass or similar).**<br><br>**Where applicable, the monitoring and verification of sustainable biomass is done according to the process determined by RED II directive or similar and as implemented by national authorities, or via similar process if in an area where RED II is not applied.** | Y | Project_Plan_RTE_FINAL.pdf (Section 2.1) | Purchase agreements with regional providers confirmed, copies available if required. | Biomass sourced from land adjacent to RTE, as agricultrural land that has been farmed since at least 1972. Aligns with the sustainability standards set forth by the EU directive on land-use changes | | |
| | GSCM 4.2.2, 5.1.2 | **In the case of biogenic CO2 capture, the Supplier utilizes radiocarbon isotope analysis (14C, C-14, Carbon-14) (C14) results based on ISO 13833 or ASTM D6866 methods demonstrating biogenic fraction of the captured CO2.**<br>**- analysis is performed periodically or continuously**<br>**- analysis is performed by qualified persons**<br>**- analysis is performed using properly calibrated equipment**<br>**- for facilities using multiple or variable carbon containing sources, samples should typically be completed for each source type and delivery**<br><br>**Note: Capture via DAC is excluded from this requirement.** | Y | CO2 analysis constitutes from Scrubber 4-2-2019.pdf, RTE CO2 Nov 21st 2023.pdf, and Email from Puro dated 2/16/2023: "The C-14 test is only needed when it is a mixed source of fossil and biogenic CO2." CO2 analysis constitutes from Scrubber 4-2-2019.pdf | All CO2 from ethanol production process. Biomass is not mixed with anthropogenic carbon. | radiocarbon isotopic analyses conducted by accredited laboratory (Isotech) March 2022. Ongoing periodic CO2 purity GC/MS analyses conducted on quarterly bases by accredited laboratory (Airborne Labs International, ISO 17025). Currently 7 sample analyses average CO2 = 99.95% with standard deviation 0.064 | 99.9 | % |
| | GSCM 4.2.4 | **For EOR+ applications, the CO2e in the extracted oil must be monitored and reported and deducted in the LCA from the total CO2 injected**<br>**- evidence must be provided of accurate measurement of oil produced via EOR activity**<br>**- evidence must be presented regarding total carbon content of the produced oil by appropriate analytical methods, using qualified laboratories and representative samples of produced oil** | NA | NA | NA | NA | NA | |
| | GSCM 4.2.5, 5.2.2 | **The CO2 Removal Supplier has provided the total volume of CO2 captured or amount of carbon containing source (in kg and in kg CO2e) and supporting data and documentation. Documentation should clearly indicate any significant changes in capture process, process upsets, or stops.** | Y | RTE Information Update 11132023.xls, Puro_LCA Report RTE 2024_FINAL_A.pdf, Red Trail CO2 Tonnes Injected Update through 1.31.2025 | monthly injection records reviewed, laboratory analyses reviewed. | 253,444.00 kg CO2 injected into well during reporting period. | 253,444 | tonne CO2e |
| | GSCM 5.2.3 | **The CO2 Removal Supplier has provided the total transported volume of CO2 or carbon containing source (in kg) and supporting data and documentation. Documentation should clearly indicate each amount fed into a pipeline or loaded into a carrier vessel or vehicle AND the amount delivered and handed over to the CO2 Storage Operator.** | NA | NA | NA | Liquified CO2 transported from plant to injection well by pressure, via 4 inch underground pipe, associated emission included in CO2 capture and conditioning processes. | NA | kgCO2e |
| | GSCM 5.2.4 | **The CO2 Removal Supplier has provided the total injected volume of CO2 (in kg CO2e) and supporting data and documentation. The Storage Operator must provide documentation of:**<br>**- the CO2 amount received from the logistics operator**<br>**- the amount of CO2 injected into geologic storage**<br>**- the date of injection of the full amount from the CO2 Removal Supplier (which is the date the amount is eligible for CORCs)** | Y | RTE Information Update 11132023.xls, Puro_LCA Report RTE 2024_FINAL_A.pdf, Red Trail CO2 Tonnes Injected Update through 1.31.2025 | All injection measurment systems and records reviewed and verified. | 18 month period 8/23-1/25 = 253,444 tonne CO2 stored. Measured continuously throughout reporting period and compiled monthly for reporting. Instrumentation includes two Schneider coriolis meters, one at fermentation capture header and another at wellhead. Meters are ISO 17025 calibration certified to uncertainty of 0.04% of reading. | 253,444 | tonne CO2e |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Additional Supporting Evidence from CO2 Removal Supplier | GSCM 5.2.1 | **GHG emissions are assessed and reported following the LCA calculation principles of ISO, WRI or PAS2050.** | Y | Puro_LCA Report RTE 2024_FINAL_A.pdf and supporting documents | all equipment and inputs associated with activity included in LCA | Estimated using GREET 2022 and ecoinvent v3.3.1 | | |
| | GSCM 5.2.1 | **The carbon balance assessment over the life-time of the project (LCA) covers the activity boundary set in GSCM section 3 and has been independently verified.** | Y | Puro_LCA Report RTE 2024_FINAL_A.pdf | | Verified | | |
| | GSCM 5.3 | **Evidence of permanent storage is provided, including:**<br>**- shipping documents for the delivery of the captured CO2 or carbon containing source to a properly permitted eligible injection and storage site, indicating it is to be used for permanent storage of carbon**<br>**- documentation that the storage site is classified and permitted under EU CCS Directive or EPA criteria (see GSCM 1.1) or under similar criteria for locations where neither criteria is applicable.** | Y | Evidence of the permanent storage.doc, 37229 Class VI Permitpdf | Previously observed carbon being injected underground. | Reviewed, approved, and permitted as Class VI injection well activities in the State of North Dakota | | |
| | GSCM 5.4.1 | **Verified contracts or attestations of no double counting on the carbon removed by another party or by CO2 Removal Supplier. This should demonstrate that the CO2 removals are solely owned by the supplier. And no claims can be made by other parties. (See GSCM 2.3.2.2)** | Y | Attestation of no double counting or double claiming 12.1.23.pdf, RTE Broom Creek Storage Facility Certicates signed 4.4.23.pdf, Voluntary and Obligated Market Allocation Method.doc,Red Trail CO2 Tonnes Injected Update through 1.31.2025 | | Fully certified by authorized supplier representatives. Monthly reporting includes quantification and documentation of total CO2 injected, net CO2 injected for project, and allocations for ethanol sale compliance obligation claims | | |
| | GSCM 5.4.2 | **Attestations of no double counting on the carbon removed by CO2 Removal Supplier. This should demonstrate that**<br>**- the CO2 Removals Supplier does not include the CO2 removals as part of its own carbon balance**<br>**- the Supplier makes no marketing or branding claims or carbon neutrality or net negativity with other services provided by the supplier (such as waste treatment) if the CO2 removal certificates are sold or to be sold.** | Y | | | | | |
| | GSCM 4.5.3 | **For EOR+ applications, the CO2e in the extracted oil must be monitored and reported and deducted in the LCA from the total CO2 injected**<br>**- evidence must be provided of accurate measurement of oil produced via EOR activity**<br>**- evidence must be presented regar** | NA | NA | NA | NA | | |

| Quantification and Calculation Checklist - Output Audit | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Verified Calculated Values | GSCM 4.1 | **CORCs are calculated in accordance with the GSCM Methodology as CORCs (kgCO2e) = $C_{captured}$ - $E_{project}$ - $C_{loss}$** | Y | Puro_LCA Report RTE 2024_FINAL_A.pdf, RTE – puro_LCA Model – GCS_G.xls, RTE – puro_LCA Result reporting – GSC_B.xls, Red Trail CO2 Tonnes Injected Update through 1.31.2025 | Etransport and Einjection, and Closs are assumed to be negligible (zero). | Documentation review of data collected through period 8/23 to 1/25. Methodology verified conformant to methodology | 221,264 tonnes net CO2 injected | CORCs |
| | GSCM 4.4 | **$C_{captured}$ = CO2 measured at the capture site (in kg CO2e). Eligible fraction is calculated following Sections 4.2.2-4.2.4. (see rows 34-38)** | Y | | | capture stated as NA (all CO2 is from on-site fermentation), and reported as CO2 injected | 253,444 | tonne CO2e |
| | GSCM 4.4 | **$E_{project}$ = $E_{capture}$ + $E_{transport}$ + $E_{injection}$ + $E_{equipment}$** | Y | | Includes compression, scrubbing, cooling, and injection energy, and embodied equipment emissions | Verified | 32,180 | tonne CO2e |
| | GSCM 4.4 | **Ecapture = includes all emissions from Capture phase, including energy use in capture, compression, and liquefaction, emissions from purpose grown biomass sourcing and conversion (i.e. to bio-oil), emissions related to capture chemicals (sorbents) or membranes, and system maintenance and regeneration.** | Y | | Biogenic CO2 is acquired as waste in an as is form from existing fermentation processes, and does not include upstream LCA considerations | The alternative to sequestration is venting. | 0.127 | tonne CO2e emitted per tonne CO2e injected |
| | GSCM 4.4 | **Etransport includes all emissions from transportation of captured CO2 from capture site to injection site, including those associated with vehicle fuel use, pumping energy, etc. Emission factors used should be documented and well accepted.** | Y | NA | No transportation confirmed | | Included in Ecapture | kgCO2e |
| | GSCM 4.4 | **Einjection should include all emissions associated with injection, such as energy use for compression, pumping, injection, or any intermediate related activities such as storage.** | Y | Puro_LCA Report RTE 2024_FINAL_A.pdf, RTE – puro_LCA Model – GCS_G.xls, RTE – puro_LCA Result reporting – GSC_B.xls, Red Trail CO2 Tonnes Injected Update through 1.31.2025, RR Electricity Usage | Confirmed, power meters 202556, 201121, 210129, and 600097 dedicated to CCS operations | Power only, confirmed all relevant equipment included, power meter readings recorded monthly. Power meters are revenue grade utility meters owned and maintained by RoughRider Electric | Included in Ecapture | kgCO2e |
| | GSCM 4.4 | **Eequipment should include emissions from construction and delivery of capture and injection equipment, and associated with production and delivery of materials used to manufacture such equipment. Such emissions may be calculated using documented emission factors for the construction and materials processes or via a cost-based emission factor and the equipment capital costs.** | Y | | verified all CCS process equipment included | Estimated using GREET 2022 and ecoinvent v3.3.1 | 1,566 | kgCO2e |
| | GSCM 4.4 | **$C_{loss}$ = $C_{captured}$ - $C_{injected}$<br>Carbon losses are accounted for in the CORC calculation.<br>Cinjected is the amount of carbon measured at the point of injection (for a single user / storage site or with separate injection wells and measurements at a multi user site).<br>For a multi-user injection site where injected amount is not monitored directly or unambiguously (separate from other injections), Cinjected may be calculated based on calculated losses during transportation and injection as $C_{captured}$-$C_{transport}$($C_{efficiency,logistic}$)($C_{efficiency,injection}$)** | Y | | confirmed as no losses, coriolis meter at compression point invalid for certain periods | Verbal confirmation that losses are negligible | 0.00 | kgCO2e |
| Calculation Details & Considerations | GSCM 4.3.1 | **Emissions from the Project is the sum of GHG emissions from the activity (geo-stored carbon) included within the activity boundary. Those are: direct emissions (scope 1 and 2) from capture, transport and injection as well as emissions from chemicals, membranes and purpose-built equipment including the construction and materials for the equipment.** | Y | Puro_LCA Report RTE 2024_FINAL_A.pdf | No additional carbon sources witnessed. | | | |
| | GSCM 4.3.2 | **CO2 losses are regarded as any difference between CO2 captured (total in kgCO2e) and CO2 injected to storage (total in kgCO2e) (see section 4.4 calculation parameters). See Row 56** | Y | | Remote audit, verbal confirmation | | | |
| | GSCM 4.3.3 | **All emissions from energy use are within the activity boundary and are accounted for when quantifying the net CO2 Removal. Energy used for geo-stored carbon activities is not required to be 100 % carbon free.** | Y | | Remote audit, verbal confirmation | | | |
| Uncertainty Quantification | GSCM 4.5.1 | **If there is uncertainty in measurement of $C_{CAPTURED}$, $C_{INJECTED}$ or $C_{TRANSPORT}$ the lower end of the range is used in the quantification. Document uncertainty value and range.** | N | wellhead Flow meter calibration certificate.pdf, RTE CO2 Nov 21st 2023.pdf, Calibration Report June 2024 | Best practices used for measurement of Ccaptured and Cinjected | Uncertainty analysis not completed. Recommended in future for completeness | | |
| | GSCM 4.5.2 | **If there is uncertainty in metering or analyzing the carbon content of carbon-containing substance biogenic fraction of the captured CO2 due to sampling or testing techniques, the lower end of the range is used in the quantification. Document the observed range or uncertainty** | Y | wellhead Flow meter calibration certificate.pdf, RTE CO2 Nov 21st 2023.pdf, Calibration Report June 2024 | Inherent measurement error, process variability, and overall uncertainty is very low. | Uncertainty analysis recommended in future for completeness | | |

# Appendix 2: Verifier Qualifications

Supporting documentation, including verifier resumes, and verifier or corporate accreditations are also included in this appendix.

## Verifier Qualifications

| | |
|---|---|
| **Company Name:** | **Red Trail Energy, LLC** |
| **Date:** | **1/15/2025** |

| | |
|---|---|
| **Verifier Name:** | **Kelly Inder-Nesbitt** |
| **Company Name (where applicable):** | **350Solutions** |
| **Verifier Contact Information:** | Kelly@350solutions.com / +1 202 768 5049 |
| **Verifier Address:** | **1053 E. Whitaker Mill Rd. Suite 115, Raleigh, NC 27604** |
| **Verifier Scope of Activities:** | **Output Audit through review of key technology components, operational data, and documentation.** |

| **Verifier Qualifications** | **Criteria Met?** | **Evidence / Notes** *(note how the criteria was met, specific documents - resume/CV, publications, certifications, etc.).* |
|---|---|---|
| ***Verifier has relevant technical knowledge of the type of technology being evaluated and carbon removal processes in general*** | | |
| ***A) Does Verifier have:*** | | |
| 1. An in-depth technical knowledge of the technology type under verification; | ☑ | 350Solutions is accredited to ISO/IEC 17020:2012 and ISO 14034 Environmental Technology Verification (ETV) as a Type A (third party) Inspection Body (ANAB Certificate Number: AI-2618). The technical scope of 350's accreditation includes verification of performance and environmental impact as it relates to design, materials, equipment, installation and operations of technologies in the categories of Energy, Clean Production and Process, and Air Pollution Monitoring and Abatement. As documented in 350Solutions' ETV Standard Operating Procedure (ETV QPM 350-223-03), and Quality Systems Procedures for verifier qualifications (QSP-350-005-02), 350Solutions conforms to the requirements of ISO 17020 Annex A with respect to verifier qualifications and procedures. These procedures and quality management programs are generally relevant to verification under the Puro.Earth General Standard. Note that verifications completed for Puro.Earth are not equivalent to ISO 14034 verifications.<br><br>350 staff have participated in the evaluation and verification of novel technologies that sequester carbon via various methods, including biomass conversion to liquids, solids, and other products which are then permanantly stored in ways such as land application or geologic storage, conversion of captured $CO_2$ into building materials and co-products, and the production of chemicals, fuels, and products via biomass pyrolysis and gasification. 350 also served as lead verifier for the Carbon XPrize competition and contributed to the development of procedures and processes for verification of relevant calculations, modeling, and statistical methods in order to assess team results and calculations of performance metrics and uncertainty. 350 has demonstrated knowledge of data quality and data validation approaches and execution in supporting verification of performance claims and results. |
| 2. Knowledge of specific risk areas associated with performance of such technologies (i.e. common failure points, performance issues, barriers to scaleup); | ☑ | |
| 3. Knowledge of the environmental implications related to the use of the technology from a life cycle perspective, such as impact of the technology on lifecycle $CO_2$ emissions and carbon removal; | ☑ | |
| 4. Knowledge of relevant applicable test methods and standards for evaluating performance or impact of the technology; | ☑ | |
| 5. Knowledge of relevant calculation, modeling, and statistical methods in order to assess test results and calculations of performance metrics and uncertainty, as applicable; | ☑ | |
| 6. Knowledge of data quality and data validation approaches, including QA/QC procedures, for example. | ☑ | |
| ***Verifier is a credible independent 3rd party*** | | |
| ***B) Is Verifier:*** | | |
| 1. third-party body independent of the team registered for the Puro Earth CORCs; | ☑ | 350Solutions is accredited to ISO/IEC 17020:2012 and ISO 14034 ETV as a Type A (third party) Inspection Body. As documented in 350Solutions ETV Policy Manual (ETV QPM 350-200-03), 350Solutions conforms to the requirements of ISO 17020 Annex A with respect to impartiality for Type A inspections, pursuant to ISO 14034 activities. |
| 2. Not directly involved in the design, manufacture or construction, marketing, installation, use or maintenance of the specific technologies submitted to Puro.Eargh for verification, or represent the parties engaged in those activities. | ☑ | |
| 3. Not part of a legal entity that is engaged in design, manufacture, supply, installation, purchase, ownership, use or maintenance of the items inspected. | ☑ | |

**Kelly Inder-Nesbitt**
**Senior Carbon Removal Verification Engineer, 350Solutions**

**Education:**

- Master of Science in Geography, Archaeology, and Environmental Studies, University of the Witwatersrand, 2014
- Bachelor of Science with Honors in Geography, University of the Witwatersrand, 2011
- Bachelor of Arts in Geography and Archaeology, University of the Witwatersrand, 2010

**Experience Summary:**

At 350Solutions, Kelly specializes in verifying carbon removal projects to ensure compliance with ISO 14034 standards and carbon registry requirements. With over a decade of experience in environmental compliance and carbon management, she brings extensive expertise in operational compliance and MRV framework implementation, enhancing accuracy, transparency and integrity in the voluntary carbon market.

Kelly's career spans multiple sectors, including aquaculture, mining, and carbon removal technology, where she has developed and audited environmental management systems that promote sustainable practices and attract investor finance. At 350Solutions, she leads the validation of diverse carbon removal pathways, including biochar, BECCS, DAC and direct ocean capture and biomass burial. Her responsibilities encompass site audits and rigorous evaluation of MRV systems to ensure scientifically validated project claims.

Previously Kelly led the development of Brilliant Planet's carbon dioxide removal methodology protocol for algal biomass burial and contributed as an author. She was also responsible for developing and implementing an ISO 14001 compliant EHSS Management System for the FirstWave Group, who are aquaculture industry leaders in Southern and Eastern Africa. This system is also aligned with IFC World Bank Best Practices and leveraged software tools to streamline compliance monitoring and enhance ESG reporting for investor and regulatory alignment.

Throughout her career, Kelly has consistently collaborated with project developers, communities, regulators, and clients to enhance the credibility of environmental initiatives through rigorous documentation and alignment with international standards. Her approach emphasizes precise data management and actionable reporting, elevating compliance practices into a strategic, value-adding process that drives sustainable business growth.

Kelly's strong communication skills and commitment to fostering collaboration enable her to manage complex compliance initiatives effectively. Her ability to bridge the gap between technical requirements and stakeholder expectations continues to advance science-driven, impactful solutions in the carbon removal industry.

**William Chatterton**
**350Solutions**
**Senior Verification Manager**

**EDUCATION**
B.S. Environmental Science, SUNY at Plattsburgh, 1982
A.A.S. Environmental Technology, Paul Smith College, 1979
Certified Measurement and Verification Professional (CMVP), 2019

**OVERVIEW AND EXPERTISE**
William Chatterton is an Environmental Scientist with over 30 years' experience in demonstration, evaluation, and performance verification of technologies addressing environmental issues, advanced energy production and use, and carbon removal. His skills include management, design, and execution of technology demonstration and verification projects, with particular expertise in measurement, reporting, and verification (MRV) of technology performance. He serves as a Senior Verification Manager at 350Solutions and manages projects and programs for commercial and government clients in these areas. During his previous 20 years at Southern Research Institute, Mr. Chatterton managed and supported programs designed to integrate, demonstrate, and evaluate technology performance in the advanced energy and environmental mitigation fields. Technology demonstrations and evaluations that he has been involved with include technologies designed to promote sustainable energy sources, increase energy use and efficiency, mitigate GHG and other emissions, and in most cases provide other social and economic benefits to potential users.

At 350Solutions, he has led efforts toward 350Solutions becoming the first US-based technology evaluation firm accredited to conduct Environmental Technology Verifications under the international standard ISO 14034 – an international standard issued in 2016 to unify the general approach for the evaluation of innovative technologies with potential beneficial impact on the environment.

Mr. Chatterton has had technical roles in several projects focused on identifying and evaluating carbon dioxide (CDR) removal technologies. Under these projects, he verifies the efficacy, performance, scalability, and sustainability of a range of carbon removal technological approaches. Each project culminated in verification statements and reports that summarized verification findings, presented verified performance data, and identified risks associated with broad implementation of the technologies.

**PROFESSIONAL EXPERIENCE**
**350Solutions: 08-2019 – Present**
**Senior Verification Manager:** In this role, Mr. Chatterton manages and executes technology performance demonstrations and verifications of emerging technologies including carbon removal, advanced energy, emissions mitigation, and transportation technologies for commercial clients and U.S. governmental agencies. These performance evaluations generally involve evaluation of commercial feasibility, economic impacts (installation, operating, and capital costs, simple payback, and return on investment), environmental impacts (primarily greenhouse gas and criteria pollutant emission reductions), and technology performance. He also manages and monitors 350Solutions' quality management programs and ISO accreditations.

Recently, he has led diligence and verification activities of CDR technologies for an advance market commitment consortium that aims to accelerate the development of carbon removal technologies by guaranteeing future demand for them. Under a recent project, he verified the efficacy, performance, scalability, and sustainability of two leading enhanced rock weathering (ERW) technologies in the Southern US.

He has also led or supported several technology verifications and performance audits of CDR technologies for one of the world's leading crediting platforms for engineered carbon removal. Technologies verified have included biochar, geologic storage, ERW, and carbonated materials CDR systems.

Previously, Mr. Chatterton served as lead verifier in support of the NRG-Cosia Carbon XPRIZE competition. Following ISO 14034 protocol, the performance of ten $CO_2$ capture and conversion technologies were independently evaluated and verified at pilot scale demonstrations while utilizing $CO_2$ in flue gas. His specific roles in supporting this project included review of technology specifications and commissioning, development of verification plans, field verification of performance, and development and submittal of ISO conformant verification reports and statement.

**Southern Research Institute: 1999 - 2019**
**Program Manager, Energy & Environment Technologies:** As Program Manager, Mr. Chatterton has managed and executed several technology performance demonstrations and verifications of emerging energy (efficiency and green building) and transportation technologies, primarily for U.S. governmental agencies, energy research associations, and state energy agencies. These performance evaluations have involved evaluation of commercial feasibility, economic impacts (installation, operating, and capital costs, simple payback, and return on investment), environmental impacts (primarily greenhouse gas and criteria pollutant emission reductions), and technology performance. He has also directed field tests at industrial or commercial sites of oil and gas extraction and processing, power generation, advanced energy, green building, and mobile source technologies. Technology performance assessments typically include management of multiple team efforts and result in peer reviewed deliverables such as test plans and reports and other outreach activities.

**Project Manager:** Managed projects for both private and governmental clients primarily in support of EPA's Environmental Technology Verification (ETV) Greenhouse Gas (GHG) Center. Technology demonstrations focused on energy efficient, GHG relevant, and environmentally sustainable technologies including advanced power generation systems (CHP and micro-CHP), fuel cells, the oil and gas industry, and transportation technologies (on- and non-road retrofits and emerging technologies). As a senior project manager at Southern, he has been involved with performance verification of numerous GHG mitigation technologies and several distributed generation electrical generators, many in NYS. His support of these verifications has included lead or technical support on test plan development, design and implementation of field-testing activities, data evaluation and presentation, and reporting of results. He has managed performance evaluations of four alternative energy cogeneration systems including microturbine, internal combustion, and fuel cell-based systems, all fueled with biogas. Under EPA's ETV Program, assisted with the formation of and participated in two Stakeholder Groups – The Oil and Gas Industry Stakeholder Group, and the Advanced Energy Stakeholder Group.